

CLAIMS

1. A hydrogen occluding material which comprises an aluminum hydride represented by the formula (1) below.



(where  $0 \leq x \leq 3$ .)

2. The hydrogen occluding material as defined in Claim 1, which is capable of hydrogenation and/or dehydrogenation at  $200^\circ\text{C}$  or below.

3. The hydrogen occluding material as defined in Claim 1, which occludes and releases hydrogen gas (in the form of hydrogen molecules or hydrogen atoms) under adequate control of pressure and/or temperature.

4. The hydrogen occluding material as defined in Claim 1, which contains a dopant functioning as a catalyst.

5. The hydrogen occluding material as defined in Claim 4, wherein the dopant is at least one species selected from transition metals belonging to groups III to V of the periodic table, chromium, iron, nickel, and alkali metals, and compounds thereof.

6. The hydrogen occluding material as defined in Claim 4, wherein the amount of the dopant is 0.2 to 10 mol% of the amount of the aluminum hydride.

7. The hydrogen occluding material as defined in Claim 1 or 4, which is in the form of fine powder.

8. A method for using a hydrogen occluding material, said method comprising hydrogenating and/or dehydrogenating at  $200^\circ\text{C}$  or below a hydrogen occluding material composed of

an aluminum hydride represented by the formula (1) below.



(where  $0 \leq x \leq 3$ .)

9. The method for using a hydrogen occluding material as defined in Claim 8, which causes hydrogen gas (in the form of hydrogen molecules or hydrogen atoms) to be occluded and released under adequate control of pressure and/or temperature.

10. The method for using a hydrogen occluding material as defined in Claim 8, wherein the hydrogen occluding material contains a dopant functioning as a catalyst.

11. The method for using a hydrogen occluding material as defined in Claim 10, wherein the hydrogen occluding material contains a dopant which is at least one species selected from transition metals belonging to groups III to V of the periodic table, chromium, iron, nickel, and alkali metals, and compounds thereof.

12. The method for using a hydrogen occluding material as defined in Claim 10, wherein the hydrogen occluding material contains the dopant in an amount of 0.2 to 10 mol% of the amount of the aluminum hydride.

13. The method for using a hydrogen occluding material as defined in Claim 8 or 10, wherein the hydrogen occluding material is in the form of fine powder.